PB-218 398

EXHAUST EMISSIONS FROM A PASSENGER CAR EQUIPPED WITH "BRISKO'S: HEAVY DUTY PCV VALVE"

Henry L. Gompf

Environmental Protection Agency
Ann Arbor, Michigan

February 1971

DISTRIBUTED BY:

NTIS

National Technical Information Service
U. S. DEPARTMENT OF COMMERCE
5285 Port Royal Road, Springfield Va. 22151

APTD-1423

71-20

PB 218 398

Exhaust Emissions from a Passenger Car Equipped with "Brisko's Heavy Duty PCV Valve"

February 1971

Henry L. Gompf
Division of Emission Control Technology
Air Pollution Control Office
ENVIRONMENTAL PROTECTION AGENCY

Reproduced by
NATIONAL TECHNICAL
INFORMATION SERVICE
U S Department of Commerce
Springfield VA 22151

5

BIBLIOGRAPHIC DATA SHEET	1. Report No. APTD-1423	2.	3. Recipient's Accession No. PB-218598
4. Title and Subtitle: Exhaust Emissions from a Passenger Car Equipped with "Brisko's Heavy Duty PCV Valve"			5. Report Date: February 1971 6.
7. Author(s): Henry L. Gompf			8. Performing Organization Rept. No.
9. Performing Organization Name and Address: ENVIRONMENTAL PROTECTION AGENCY Division of Emission Control Technology Ann Arbor, Michigan			10. Project/Task/Work Unit No. 11. Contract/Grant No.
12. Sponsoring Organization Name and Address: Same			13. Type of Report & Period Covered: Inhouse 14.

15. Supplementary Notes

16. Abstracts

The exhaust emission characteristics of the "Brisko Heavy Duty PCV Valve Adaptation" was studied as a part of an evaluation of retro-fit devices. The Brisko device replaced the stock PCV valve on a 1970 Chevrolet equipped with a 350 CID, 300 hp, high compression engine and automatic transmission. The following tests were performed: six baseline tests during which the vehicle was in stock condition, and five device tests during which the vehicle was equipped with the Brisko device. All tests were performed according to the Federal test procedures for 1972 and later testing, using a constant volume sampling technique. The results, which are tabulated, led to the following conclusions: (1) emission reductions were marginal and would not by themselves warrant installation of the device; (2) only a marginal fuel saving was measured.

17. Key Words and Document Analysis. 17a. Descriptors

Air pollution
Exhaust emissions
Automobiles
Tests
Standards
Fuel consumption
Hydrocarbons
Carbon dioxide
Carbon monoxide
Nitrogen oxides

17b. Identifiers/Open-Ended Terms

Brisko PCV Valve
Retro-fit devices
Federal Test Procedures (1972)
Constant Volume Sampling Technique (CVS)

17c. COSATI Field/Group 13B

18. Availability Statement: Unlimited	19. Security Class (This Report) UNCLASSIFIED	21. No. of Pages 5
	20. Security Class (This Page) UNCLASSIFIED	22. Price $3.00 MF0.95

Device Tested

The exhaust emission characteristics of the "Brisko Heavy Duty PCV Valve Adaption" was desired as part of the continuing evaluation of retro-fit type devices. Specifically, interest in testing was expressed by the State of Wisconsin. The Brisko device replaced the stock PCV valve on a 1970 Chevrolet Impala. This car was equipped with a 350 CID, 300 hp, high compression engine and automatic transmission. This car is part of the EPA fleet and extensive baseline data were available.

Test Procedure

The following tests were performed:

6 Baseline tests - vehicle in stock condition.
5 Device tests - vehicle equipped with Brisko device.

All tests were performed according to the Federal test procedure to be used for the certification of 1972 and later model vehicles. The 1972 FTP is a constant volume sampling technique as specified in the November 10, 1970 Federal Register. The bag samples taken were analyzed using non-dispersive infrared analysis for carbon monoxide and carbon dioxide. Hydrocarbons were measured by the flame ionization detector. Two methods were used to measure oxides of nitrogen: Saltzman wet chemical and the chemiluminescent technique.

Emission Results

A table is presented at the end of this report containing individual test data compiled during the evaluation.

Comparing the mean baseline emissions to the mean device emissions, reductions of 4 percent in hydrocarbons, 13 percent in carbon monoxide and about 10 percent in oxides of nitrogen are seen. At best these must be considered marginal reductions since test variability is of the same magnitude.

Fuel Consumption

The table at the end of the report indicates a 3 percent increase in fuel economy. Again this percent is too marginal with respect to test variability. No significant fuel savings was measured.

Conclusions

1. Emission reductions were marginal and would not by themselves warrant installation of the device.

2. Only a marginal fuel saving was measured.

1970 HEW Chevy - Brisko

1972 Federal Test Procedure

With Brisko Device

	Fuel Cons. mpg		HC gpm	CO gpm	CO_2 gpm	NOx* gpm as NO_2	
	Wt.	Anal.				Saltz.	CI
	12.5	12.6	4.20	44.10	638.38	5.59	----
	15.0	12.5	4.56	47.62	633.63	4.94	----
	12.2	12.4	4.80	40.30	654.00	6.66	6.3[illegible]
	12.7	13.4	4.32	42.10	599.60	4.40	5.76
	13.4	13.1	4.39	46.02	608.83	4.92	5.98
				Average			
	13.2	12.8	4.45	44.03	626.89	5.30	6.10
1	+14%	+5%	+8%	+8%	+4%	+26%	+8%
1	-8%	-3%	-6%	-8%	-4%	-17%	-6%

Baseline

2	12.4	12.1	4.76	66.90	629.74	------	----
2	10.9	11.4	5.33	51.10	695.91	8.39	----
3	13.2	12.9	4.65	49.68	610.90	4.94	5.51
3	13.5	13.0	4.36	45.01	611.7	5.26	7.38
3	13.1	----	4.36	44.10	561.34	5.82	6.75
3	13.5	----	4.29	45.35	544.69	4.93	6.70
				Average			
	12.8	12.4	4.63	50.36	609.05	5.87	6.59
1	+5%	+5%	+15%	+33%	+14%	+43%	+11%
1	-15%	-8%	-7%	-12%	-11%	-16%	-16%

Percent Reductions

-3%	-3%	4%	13%	-3%	10%	7%

* Oxides of nitrogen are corrected for humidity.

1 Percent variability about the mean.
2 Baseline prior to installation of device.
3 Baseline after removal of device.